

Safety Evaluation by the DOE Regulatory Unit
of Proposed Authorization Basis Amendment Request
ABAR-W375-99-00004,
to the Safety Requirements Document for the
Tank Waste Remediation System - Privatization Project
(DOE Contract DE-AC06-96RL13308)

1. INTRODUCTION

In accordance with the requirements of RL/REG-97-13, *Regulatory Unit Position on Contractor Initiated Changes to the Authorization Basis*, Revision 5, BNFL submitted an Authorization Basis Amendment Request (ABAR) to make miscellaneous revisions to the Safety Requirements Document (SRD).¹ The essential elements of the ABAR are:

- Appendix A, "Implementing Standard for Safety Standards and Requirements Identification," of Volume II of the SRD is revised to:
 - Add the requirements for protection of the operator when operator actions are credited in the control strategy for hazardous events
 - Add the requirements for classification of Systems, Structures and Components (SSCs) and quality levels
 - Add the definition of important to safety
- Attachment F, "Radiological Exposure Standards for the TWRS-P Project," to Volume I is relocated as Appendix D (same title) of Volume II of the SRD.
- Appendices A and D are revised to incorporate and consolidate information contained as *ad hoc* standards in numerous sections of the Integrated Safety Management Plan (ISMP). The related references to ISMP sections as *ad hoc* standards are deleted from specific Safety Criteria
- References to Section 3.8 "Criticality Safety" of the ISMP are removed from criticality safety-related Safety Criteria. In addition, BNFL proposes to allow establishing the margin of criticality safety through comparison with safely subcritical concentrations derived from experiments.

Much of the proposed amendment is administrative in nature. That is, it deals with the reorganization and relocation of material in authorization basis documents. However, the

¹ 99-RU-0558, letter from A. J. Dobson to D. C. Gibbs, September 20, 1999, "Contract No. DE-AC06-96RL13308 - W375 - Authorization Basis Amendment Request Regarding Miscellaneous Revisions to the SRD."

changes do revise and delete standards previously identified in the approved SRD and are therefore subject to Regulatory Unit (RU) review.

2. BACKGROUND

BNFL is required by contract to conform to certain top-level standards, RL/REG-96-0006, *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for TWRS Privatization Contractors*, and to define subordinate standards for implementing the top-level standards. In several cases, BNFL chose to use sections of the ISMP as *ad hoc* subordinate standards, rather than specify nationally or internationally recognized consensus standards. In this ABAR, BNFL is replacing several ISMP-based subordinate standards with equivalent reference to SRD appendices. In addition, BNFL is proposing that other specified safety criteria not have subordinate standards.

3. EVALUATION

The BNFL analysis of the proposed changes documented in the ABAR provides the linkage between the current *ad hoc* standards and their incorporation into other portions of the Authorization Basis, primarily SRD Appendices A and D. The BNFL analysis also shows all changes to the SRD text.

In order to establish the acceptability of the proposed changes, the RU reviewed the current subordinate standards against the proposed standards of Appendices A and D. Subject matter experts in the areas affected by the proposed changes conducted this review. Each change was examined individually. Specifically, the RU examined the BNFL rationale for each change, with an emphasis on the equivalency of the current subordinate standard and the proposed standard. The subject matter experts also assessed whether the proposed subordinate standards adequately implement the top-level standards.

The RU also examined how Appendices A and D were modified to incorporate the implementing language previously contained in the ISMP. In particular the RU examined whether the changes, taken together, represented a decrease in commitment.

The RU determined that the proposed appendices are equivalent to the existing *ad hoc* standards and do not represent a decrease in commitment. The RU also found that the consolidation of material into the two appendices simplifies and clarifies the explanation of how BNFL establishes a set of radiological, nuclear, and process safety requirements and standards (Appendix A) and the basis for radiological exposure standards (Appendix D).

The RU assessed the BNFL proposal that specific safety criteria be considered stand-alone subordinate standards, especially as related to criticality safety. The RU determined that specific Safety Criteria 3.3-1 through 3.3-8 as stand-alone subordinate standards provide adequate assurance of nuclear criticality safety. Reference to the ISMP sections, as implementing standards, is not required in these instances to assure adequate safety and can be removed as requested in the ABAR.

The ABAR also proposes to include an additional clause in Safety Criterion 3.3-2. This clause would provide an alternative to the existing requirement in Safety Criterion 3.3-2 that “the multiplication factor (K_{eff}) including all biases and uncertainties at 95% confidence level, shall be shown to not exceed 0.95 under all credible normal, off normal, and accident conditions.” The alternative clause proposed in the ABAR would state “OR the evaluated parameter (i.e., effecting the margin of subcriticality) is equal to or less than a corresponding subcritical limit given in accepted ANSI/ANS-8 standards or guides that are selected for use in the RPP-WTP² Project.”

This alternative clause as proposed leaves undefined which “standards or guides” are to be adopted by BNFL and as such, is not an appropriate standard for inclusion in the SRD. This alternative clause is also unnecessary. The RU is aware of no nationally accepted guides or standards that provide subcritical limits directly applicable to the TWRS-P. This issue was discussed with BNFL staff. In these discussions, BNFL staff identified no situation where the alternative clause will provide an acceptable alternative to the existing SRD requirement for K_{eff} to be equal to or less than 0.95. Based on these considerations, the RU disapproves inclusion of this clause in the SRD and this portion of the ABAR is rejected.

Finally, the RU examined all changes against the previous analyses of the technical areas covered by this ABAR contained in the original evaluation reports of the BNFL SRD,³ ISMP⁴ and ISA⁵ to ensure that the proposed standards addressed any noted inadequacies. The RU also considered the current project status, including ongoing discussions with BNFL on correcting known deficiencies. The RU found no inconsistencies among the original evaluation reports, activities to correct known deficiencies and the proposed changes.

4. CONCLUSION

On the basis of the considerations described above, the RU has concluded that there is reasonable assurance that the health and safety of the public, the workers, and the environment will not be adversely affected by this proposed amendment. The proposed amendment complies with applicable laws, regulations, and requirements, and conforms with DOE-stipulated top-level safety standards and principles. The amendment request includes certification that the proposed revision to the SRD was derived using the RU approved process described in DOE/RL-96-0004, *Process for Establishing a Set of Radiological, Nuclear, and Process Safety Standards and Requirements for TWRS Privatization*. Accordingly, this review concludes that the proposed amendment to the authorization basis, with the exception noted, is acceptable.

² River Protection Project - Waste Treatment Plant (RPP-WTP)

³ RL/REG-98-01, Rev. 0, "DOE Regulatory Unit Evaluation Report of the BNFL Inc. Safety Requirements Document," March 1998, Section 3.2.3.1.5, "Configuration Management."

⁴ RL/REG-98-03, Rev. 0, "DOE Regulatory Unit Evaluation Report of the BNFL Inc. Integrated Safety Management Plan," March 1998, Section 3.2.2.5, "Configuration Management."

⁵ RL/REG-98-09, Rev. 0, "DOE Regulatory Unit Initial Safety Evaluation Report of the BNFL Inc. Initial Safety Assessment," March 1998, Section 3.9.3.1, "Configuration Management."